

Remarks

Entry of this amendment, reconsideration of the application and allowance of all claims are respectfully requested. Claims 1-54 remain pending.

Specification paragraphs [0008] and [0009] and the independent claims are amended herein to correctly recite “therefor” responsive to the specification and claim objections noted in the Office Action. Based on these amendments, withdrawal of the outstanding objections is respectfully requested.

By this paper, independent claims 1, 15, 20, 34, 35, 40, 41 & 51 are amended to more particularly point out and distinctly claim the subject matter of the present invention. These amendments to the claims constitute a *bona fide* attempt by the Applicants to advance prosecution of this application and obtain allowance of certain claims and are in no way meant to acquiesce to the substance of the initial rejection. It is believed that the amendments to the claims place all claims in condition for allowance. Support for the amended claims can be found throughout the application as filed. For example, reference paragraphs [0027] – [0030] & [0033] of the application. No new matter is added to the application by any amendment presented.

Substantively, claims 1-54 were rejected under 35 U.S.C. §103(a) as being unpatentable over Okayasu (U.S. Patent No. 5,659,554; hereinafter Okayasu) in view of Schmidt et al. (U.S. Publication No. 2002/0026630; hereinafter Schmidt) and JAD, “Test Case Identification JAD Session,” 7/2001 (hereinafter JAD), further in view of Brouwer et al. (U.S. Patent No. 6,279,124; hereinafter Brouwer) and Ottensooser (U.S. Patent No. 5,905,856; hereinafter Ottensooser). This rejection is respectfully, but most strenuously, traversed to any extent deemed applicable to the claims presented herewith.

In one aspect, Applicants’ invention is directed to a technique for testing a software component (e.g., claims 1, 20 & 41). This technique includes:

1. Creating an abstraction matrix by partitioning the software component into multiple layers. The abstraction matrix comprising state and event information taking into account relationships that exist between the multiple layers.

2. Parsing the abstraction matrix to automatically generate test cases and mapped expected results therefor.
3. Separating the test cases based on the layers of the software component and associating data structures with the separated test cases of the layers, the data structures allowing the test cases of the various layer to be uncorrelated.
4. Employing the software component in executable form to generate for each layer of the software component test case execution threads from the test cases and mapped expected results for that layer.
5. Executing in parallel at least some of the test case execution threads for at least one layer of the software component, thereby testing the software component.

In another aspect, Applicants' invention is directed to a technique for generating test cases for use in testing a software component (e.g., claims 15, 35, 40 & 51). This technique includes:

1. Ascertaining a functional specification of a software component.
2. Creating an abstraction matrix that describes the software component by partitioning the software component into multiple layers using the functional specification. The abstraction matrix comprises state and event information which takes into account relationships that exist between the multiple layers.
3. Parsing the abstraction matrix to automatically generate test cases and mapped expected results therefor.
4. Separating the test cases based on layers of the software component, and associating data structures with the separated test cases of the layers. The data structures allow the test cases of the various layers to be uncorrelated.

Advantageously, Applicants' creating of the abstraction matrix to describe the software component by partitioning the software component into multiple layers (e.g., using the functional specification) and accounting for relationships that exist between layers, allows independent tests per layer to be automatically constructed, thus significantly reducing the number of tests needed to verify a software component.

Applicant respectfully traverses the outstanding rejection on the following grounds: (1) the justifications for combining the documents as proposed are deficient; (2) the documents themselves lack any teaching, suggestion or incentive for their combination as proposed; (3) the combination is a hindsight reconstruction of the claimed invention using Applicants' own disclosed subject matter; and (4) the combination fails to teach or suggest one or more aspects of Applicants' invention as recited in the amended independent claims presented.

Initially, Applicants traverse the various reasonings justifying the combination of Okayasu, Schmidt, JAD, Brouwer & Ottensooser set forth in the Office Action. In most instances, the justifications are a hindsight attempt to reconstruct Applicants' functionality recited in the independent claims presented. For example, in combining JAD and Schmidt with Okayasu, the Office Action alleges at page 4, lines 7-9 that:

“... this would facilitate the modular control of test case administration for the same manner as software system on modularized into hierarchy or layer of sub-modules composing a upper module.”

Noticeably absent from this justification is any express teaching, suggestion or incentive identified in the art for making the proposed combination. Just as in Winner International Royalty Corp. v. Wang, 48 U.S.P.Q. 2d 1139, 1144 (D.C. 1998), wherein the court overturned a Board finding of obviousness, hindsight is always perfect and it is insufficient to prove at the time of the claimed invention, the separate elements of the device were present in the known art. “Rather, there must have been some explicit teaching or suggestion in the art to motivate one of even ordinary skill in the art to combine such elements so as to create the same invention.” Id. Winner's cited authority, Arkie Loures Inc. v. Gene Larew Tackle, Inc., 43 U.S.P.Q. 2d 1294, 1297 (Fed. Cir. 1997), similarly holds that:

It is insufficient to establish obviousness that the separate elements of the invention existed in the prior art, absent some teaching or suggestion, in the prior art, to combine the elements.

The above-noted justification does not identify a teaching, suggestion or incentive in the art to combine the references in the Office Action as required by cases like Winner and Arkie. The justification is simply a restatement of the combination, rather than a reason for the combination drawn from the prior art or from the knowledge available to one of ordinary skill in the art.

Further, upon an independent review of the applied documents, there is no teaching, suggestion or incentive for the combination in the manner proposed in the Office Action. Various fundamental differences exist between Applicants' recited functionality and the teachings of the documents themselves.

Still further, the above-noted justification for combining JAD and Schmidt with Okayasu as proposed offers no technical basis outside that which is contained in Applicants' own specification, and merely restates the results of the combination in hindsight, and thus the rejection violates the well known principle that an Applicants' own disclosure cannot be used as a reference against them.

The consistent criterion for a determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that the claimed invention should be carried out and would have a reasonable likelihood of success, viewed in light of the prior art. Both the suggestion and the expectation of success must be found in the prior art, not in Applicants' disclosure. In re Dow Chemical Company, 5 U.S.P.Q. 2d 1529, 1531 (Fed. Cir. 1998) (multiple citations omitted). The combination simply restates the result of the combination, and is therefore using Applicants' own disclosure, rather than an identified basis in the prior art, to combine the documents, in violation of this well known principle. This is yet another, independent reason why the current invention is not obvious over the collection of art applied in the Office Action.

In addition, Applicants respectfully submit that the amended independent claims presented recite processes that contain fundamental differences from any teaching or suggestion in the applied art.

For example, each of the independent claims recites the creation of an abstraction matrix by partitioning a software component into multiple layers, with the abstraction matrix comprising state and event information that takes into account relationships that exist between the multiple layers. No similar functionality is taught or suggested by the applied references. More specifically, none of the applied references teach or suggest creating an abstraction matrix by partitioning a software component into multiple layers. Additionally, none of the applied art teach or suggest creating such an abstraction matrix to include state and event information that takes into account relationships that exist between the multiple layers of the partitioned software component. For these reasons, reconsideration and withdrawal of the obviousness rejection based thereon is respectfully requested.

As a further example, Applicants recite parsing the abstraction matrix to automatically generate test cases and mapped expected results therefor. The Office Action acknowledges that Okayasu does not disclose generating mapped expected results upon parsing the abstraction and mapped expected results to the step of executing test case threads. The Office Action then notes that the manual process of setting up expected results during analysis of functional requirements and mapping of the expected results to the test results is part of the art at the time the invention was made. Without acquiescing to this characterization, Applicants respectfully submit that the independent claims presented recite parsing (by an abstraction engine) the abstraction matrix to automatically generate the test cases and mapped expected results therefor. In Applicants' approach, this specific functionality set forth is an automated process. The art applied does not teach how one would automate the manual process of generating test cases and mapped expected results.

As yet another example, Applicants' processing separates the test cases based on layers of the software component and associates data structures with the separated test cases of the layers. The data structures allow the test cases of the various layers to be uncorrelated. The Office Action notes that Okayasu does not teach this functionality, and then alleges that the recited processing would have been obvious to one skilled in the art based upon JAD and

Schmidt, neither of which expressly or by implication teach or suggest this specific aspect of Applicants' invention. Rather, the Office Action alleges that providing data structures in the form of scripts representing test cases would enable a layer-structured test case system to perform in a more controllable and modularized manner. However, none of the applied art teaches this. It is Applicants' own disclosure which discloses functionality for separating test cases based on layers of the software component, and associating data structures with the separated test cases of the layers. The data structures allow the test cases of the various layers to be uncorrelated. There is simply no analogous teaching or suggestion in the applied art of this concept.


In another example, Applicants recite in certain independent claims: employing the software component in executable form to generate for each layer of the software component test case execution threads for the test cases and mapped expected results for that layer, and then executing in parallel at least some of the test case execution threads for at least one layer of the component. The Office Action again acknowledges that Okayasu does not teach this functionality of Applicants' independent claims, and relies upon an attempted reconstruction thereof based upon Schmidt, JAD and Brouwer. Again, however, none of the applied references expressly or by implication teach one skilled in the art the functionality recited.

For all the above reasons, Applicants respectfully submit that amended independent claims 1, 15, 20, 34, 35, 40, 41, & 51 patentably distinguish over the teachings of Okayasu, Schmidt, JAD, Brouwer & Ottensooser as combined in the Office Action. Reconsideration and withdrawal of the obviousness rejection based thereon is therefore respectfully requested.

The application is believed to be in condition for allowance and such action is respectfully requested.

However, Applicants' undersigned attorney is available should the Examiner wish to discuss this application further.

Respectfully submitted,



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